

In re: Appln No. 10/642,560  
Amendment dated October 26, 2005  
Reply to Office action of October 17, 2005

This listing of claims replaces all prior versions and listings of claims in the application:

**Listing of Claims:**

1. (canceled)
2. (canceled)
3. (canceled)
4. (canceled)
5. (canceled)
6. (canceled)
7. (canceled)
8. (canceled)
9. (canceled)
10. (canceled)
11. (canceled)
12. (canceled)
13. (canceled)
14. (canceled)
15. (canceled)
16. (canceled)
17. (canceled)
18. (canceled)
19. (canceled)
20. (canceled)
21. (canceled)
22. (canceled)
23. (canceled)
24. (canceled)
25. (canceled)
26. (canceled)
27. (canceled)

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28. (canceled)
29. (canceled)
30. (canceled)
31. (previously presented) A powder having enhanced thermal and electrical conductivity, produced, in combination a:
- a. powder precursor having average particle sizes in the nanometer to micron size range produced by a process step selected from the group of solubilized, dispersed, emulsified, grinded, spray atomized and vaporized;
  - b. coating imparted to the powder precursor particles; and
  - c. reaction medium selected from the group of solvents, fluids, monomers, interpolymers, polymers, and phase change materials.
32. (currently amended) The ~~powder of~~ coating imparted to the powder precursor particles according to claim 31, wherein the coating imparted to the powder precursor particles further comprises a coating capable of acting as at least one of imparting composition stabilization, corrosion resistance and acting as a dispersant.
33. (currently amended) The coating imparted to the powder precursor particles according to process of claim 32, wherein the ~~surface-coated powder precursor~~ coating imparted to the powder precursor particles is prepared by one of:
- a. complexing a coating compound with powder precursor particles;
  - b. adsorbing a coating compound on surfaces of the powder precursor particles; ~~and or~~
  - c. organometallic chemistry.
34. (previously presented) The powder of claim 31, wherein the powder is prepared with in situ complexing of coating compound on powder precursor particles.
35. (currently amended) A ~~The~~ in situ complexing of coating compound on powder precursor particles according to claim 34 is prepared by one of:
- a. microemulsions and chemical reduction of pre-complexed metal salts;
  - b. microemulsions and reduction of pre-complexed metal salts using sonochemistry;
  - c. sonochemistry using high or ultrahigh frequency acoustic wave generation of cavitation in reaction vessel for reduction of pre-complexed metal salts;

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- d. sonochemistry using high or ultrahigh frequency acoustic wave generation of cavitation onto plating surface through plating by electroless deposition of pre-complexed metal salts;
- e. sonochemistry using high or ultrahigh frequency acoustic wave generation of cavitation onto plating surface through plating deposition by electrolysis of pre-complexed metal salts;
- f. sonochemistry using high or ultrahigh frequency acoustic wave generation of cavitation onto plating surface through plating deposition by electrolysis of pre-complexed metal salts using high frequency electrical power source;
- g. submicron atomization of pre-complexed metal salts in liquid carrier with in situ chemical reduction;
- h. submicron atomization of pre-complexed metal salts in liquid carrier with in situ electrochemical reduction;
- i. submicron atomization of pre-complexed metal salts in liquid carrier within vessel with voltage potential between atomizer and cathode;
- j. plasma processing of powder precursor with quenching in liquid carrier having pre-solubilized complexing coating compound;
- k. combustion synthesis processing of powder precursor with quenching in liquid carrier having pre-solubilized complexing coating compound;
- l. pre-complexed powder precursor dissolved in supercritical fluid with in situ chemical reduction;
- m. pre-complexed powder precursor dissolved in supercritical fluid with in situ electrochemical reduction;
- n. electrolysis of pre-complexed metal salts using high frequency electrical power source on anode and cathode;
- o. electrolysis of pre-complexed metal salts using electrically conductive material selected from group of electrolyte or conductive polymer;
- p. high pressure hydrogen chemical reduction reaction of powder precursor in liquid carrier having pre-solubilized complexing coating compound;

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- q. high pressure hydrogen chemical reduction reaction of powder precursor in liquid carrier having pre-solubilized complexing coating compound in combination with high or ultrahigh frequency acoustic wave generation of cavitation in reaction vessel;
  - r. high pressure hydrogen chemical reduction reaction of powder precursor in liquid carrier having pre-solubilized complexing coating compound in combination with high or ultrahigh frequency electromagnetic force generation in reaction vessel;
  - s. cryogenic embrittlement in combination with processes selected from the group of high pressure hydrogen embrittlement, or high | ultrahigh frequency acoustic wave generation of cavitation in reaction vessel; or
  - t. electrodialysis of pre-complexed metal salts in combination with processes selected from the group of high pressure hydrogen embrittlement, or high | ultrahigh frequency acoustic wave generation of cavitation on cathode.
36. (new) The powder according to claim 31, wherein the powder is selected from the group of metals consisting of copper, titanium, nickel, beryllium, iron, silver, gold, alloys thereof, blends thereof, and compounds thereof.
37. (new) The reaction medium according to claim 31, whereby the reaction medium is further comprised of powders selected from the group of carbons consisting of graphite, carbon nanotubes, diamond, fullerene carbons of the general formula  $(C_2)_n$ , where n is an integer of at least 30, and blends thereof.
38. (new) The reaction medium according to claim 31, wherein the reaction medium is selected from the group consisting of solids, fluids, and phase change materials.
39. (new) The reaction medium according to claim 31, wherein the reaction medium is an interpolymer.
40. (new) The reaction medium according to claim 31, wherein the reaction medium is selected from the group consisting of conjugated polymers, crystalline polymers, amorphous polymers, epoxies, resins, acrylics, polycarbonates, polyphenylene ethers, polyimides, polyesters, acrylonitrile-butadiene-styrene (ABS); polyethylene, polypropylene, polyamides, polyesters, polycarbonates, polyphenylene oxide, polyphenylene sulphide, polyetherimide, polyetheretherketone, polyether ketone, polyimides, polyarylates, styrene,

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- poly(tetramethylene oxide), poly(ethylene oxide), poly(butadiene), poly(isoprene), poly(hydrogenated butadiene), poly(hydrogenated isoprene), liquid crystal polymers, polycarbonate, polyamide-imide, copolyimides precursors, reinforced polyimide composites and laminates made from said polyimides, polyphenylated polynuclear aromatic diamines, fluorocarbon polymers, polyetherester elastomers, neoprene, polyurea, polyanhydride, chlorosulphonated polyethylene, ethylene/propylene/diene (EPDM) elastomers, polyvinyl chloride, polyethylene terephthalate, polyvinylchloride, ABS, polystyrene, polymethylmethacrylate, polyurethane, polyacrylate, polymethacrylate, and polysiloxane, aromatic copolyimide, polyalpholefins, polythiophene, polyaniline, polypyrrole, polyacetylene, polyisocyanurates, and derivatives thereof, vinyl monomers, styrene, vinyl pyridines, N-vinyl pyrrolidone, vinyl acetate, acrylonitrile, methyl vinyl ketone, methyl methacrylate, methyl acrylate, 2-hydroxyethyl methacrylate, 2-hydroxyethyl acrylate; polyols, ethylene glycol, 1,6-hexane diol, 1,4-cyclohexanedicarbinol, polyamines, 1,6-hexadamine, 4,4'-methylenebis (N-methylaniline), polycarboxylic acids, adipic acid, phthalic acid, epoxides, ethylene oxide, propylene oxide, and cyclohexene oxide, polyalkylene glycols, polyethylene glycol, polypropylene glycol, vinyl polymers, polystyrene, polyvinyl acetate, polyvinylpyrrolidone, polyvinylpyridine, polymethyl methacrylate, organic liquid-soluble polysaccharides, functionalized polysaccharides, cellulose acetate, and crosslinked swellable polysaccharides.
41. (new) The reaction medium according to claim 31, wherein the reaction medium further comprises a phase change medium selected from the group consisting of salt-hydrates, organic eutectics, clathrate-hydrates, paraffins, hydrocarbons, Fischer-Tropsch hard waxes, inorganic eutectic mixtures, acetamide, methyl fumarate, myristic acid, Glauber's salt, paraffin wax, fatty acids, methyl-esters, methyl palmitate, methyl stearate, mixtures of short-chain acids, capric and lauric acid, coconut fatty acids, propane and methane.
42. (new) The coating imparted to the powder precursor particles, wherein the coating imparted to the powder precursor particles is selected from the group consisting of azoles, benzotriazole, tolytriazole, halogen resistant azoles, and substituted derivatives thereof.

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43. (new) The azole according to claim 42, wherein the azole is selected from the group comprising of aromatic azoles, diazoles, triazoles, tetrazoles, benzotriazole, tolyltriazole, 2,5-(aminopentyl) benzimidazole, alkoxybenzotriazole, imidazoles, such as oleyl imidazoline, thiazoles, such as mercaptobenzothiazole, 1-phenyl-5-mercaptotetrazole, thiodiazoles, halogen-resistant azoles, 5,6-dimethyl-benzotriazole; 5,6-diphenylbenzotriazole; 5-benzoyl-benzotriazole; 5-benzyl-benzotriazole and 5-phenyl-benzotriazole, a combination of alkoxybenzotriazole, mercaptobenzothiazole, tolyltriazole, benzotriazole, a substituted benzotriazole, and/or 1-phenyl-5-mercaptotetrazole, a mixture of a pentane-soluble imidazoline, a pentane-soluble amide, a pyridine-based compound, a pentane-soluble dispersant, and a solvent, and combinations thereof.
44. (new) The coating imparted to the powder precursor particles, wherein the coating imparted to the powder precursor particles further comprises an inorganic corrosion inhibitor compound.
45. (new) The coating imparted to the powder precursor particles, wherein the coating imparted to the powder precursor particles comprises a cerium compound for powders selected from the group of aluminum and aluminum alloys.
46. (new) The coating imparted to the powder precursor particles, wherein the coating imparted to the powder precursor particles is selected from the group of mercapto-substituted thiodiazoles, amino-substituted thiodiazoles, and mercapto-substituted triazole, amino-substituted triazoles, oleyl imidazoline, triethanolamine and monoethanolamine for powders selected from the group of copper, silver, iron, steel and alloys thereof.
47. (new) The coating imparted to the powder precursor particles according to claim 31, wherein the coating imparted to the powder precursor particles is in sufficient amount to form at least a molecular monolayer of the coating compound on surfaces of the powder particles.